

AMENDMENTS TO THE CLAIMS

Listing of Claims

The following listing of Claims replaces all previous listings of Claims.

1. (Currently Amended) A method of obtaining debug information, comprising:

executing a sequence of instructions by a device under test (DUT),

wherein said DUT comprises a data line and a clock line;

executing the sequence of instructions by an emulator device

emulating the functions of the DUT and executing the sequence of

instructions in lock-step fashion with the DUT;

the DUT conveying I/O read information to the emulator device over

said data line during a data transfer phase; and

a host computer system reading real-time state and debug

information from the emulator device without interrupting the DUT.

2. (Currently Amended) The method according to claim 1, wherein the DUT and the emulator device operate in a cycle comprising [[a]] the data transfer phase and a control phase.

3. (Cancelled)

4. (Currently Amended) The method according to claim [[4]] 1,

wherein the I/O read information is conveyed to the emulator device after a start of instruction transition occurs and prior to execution of an instruction.

5. (Currently Amended) The method according to claim 4, wherein said DUT comprises a second data line, and wherein the I/O read information comprises eight bits of information, and further wherein the I/O read information is conveyed to the emulator device over said two data lines carrying four serial bits each over a time period defined by four system clock cycles.

6. (Original) The method according to claim 1, further comprising conveying interrupt vectors from the DUT to the emulator device during an interrupt service cycle.

7. (Original) The method according to claim 6, wherein the interrupt service cycle begins after assertion of an interrupt data line.

8. (Original) The method according to claim 1, wherein the DUT is selected from one of a microcontroller, a microprocessor, a microcomputer and an electronic circuit device incorporating an internal processor.

9. (Currently Amended) A method of obtaining debug information, comprising:

- a) executing a sequence of instructions by a microcontroller device, wherein said microcontroller device comprises a data line and a clock line;
- b) in synchronization with a), an emulator device emulating the functions of the microcontroller and executing the sequence of instructions in lock-step fashion with the microcontroller;
- c) the microcontroller conveying I/O read information to the emulator device; [[and]]
- d) a host computer system reading real-time state and debug information from the emulator without interrupting the microcontroller; and
- e) conveying interrupt vectors from the microcontroller to the emulator device during an interrupt service cycle.

10. (Original) The method according to claim 9, wherein the microcontroller and the emulator device operate in a cycle comprising a data transfer phase and a control phase.

11. (Original) The method according to claim 10, wherein the I/O read information is conveyed to the emulator device during the data transfer phase.

12. (Original) The method according to claim 11, wherein the I/O read information is conveyed to the emulator device after a start of instruction transition occurs and prior to execution of an instruction.

13. (Currently Amended) The method according to claim 12, wherein said microcontroller comprises a second data line, and wherein the I/O read information comprises eight bits of information, and wherein the I/O read information is conveyed to the emulator device over said two data lines carrying four serial bits each over a time period defined by four system clock cycles.

14. (Cancelled)

15. (Currently Amended) The method according to claim [[14]] 9, wherein the interrupt service cycle begins after assertion of an interrupt data line.

16. (Currently Amended) A method of obtaining debug information, comprising:

executing a sequence of instructions by a device under test (DUT),
wherein said DUT comprises two data lines and a clock line;
executing the sequence of instructions by an emulator device

emulating the functions of the DUT and executing the sequence of instructions in lock-step fashion with the DUT;

the DUT conveying I/O read information to the emulator device;

a host computer system reading real-time state and debug information from the emulator device without interrupting the DUT;

the DUT and the emulator device operating in a cycle comprising a data transfer phase and a control phase, wherein I/O read information is conveyed to the emulator device during the data transfer phase after a start of instruction transition occurs and prior to execution of an instruction;

wherein the I/O read information comprises eight bits of information, and wherein the I/O read information is conveyed to the emulator device over said two data lines carrying four serial bits each over a time period defined by four system clock cycles; and

conveying interrupt vectors from the DUT to the emulator device during an interrupt service cycle, with the interrupt service cycle begins after assertion of an interrupt data line.

17. (Original) The method according to claim 16, wherein the DUT is selected from one of a microcontroller, a microprocessor, a microcomputer and an electronic circuit device incorporating an internal processor.